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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,594	02/22/2002	Alan R. Reinberg	MI22-1952	8480
21567	7590	04/06/2004	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			LEE, HSIEN MING	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,594	REINBERG, ALAN R.	
	Examiner	Art Unit	
	Hsien-Ming Lee	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 53-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 55-62 is/are allowed.
- 6) ☒ Claim(s) 1-18 and 54 is/are rejected.
- 7) ☒ Claim(s) 53 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

1. This Office Action is to replace the previous Office Action mailed 12/3/2003, wherein some amended limitations (i.e. “only an upper portion of” as recited in amended claim 14 and “after the capping of the rim, forming a capacitor dielectric region” as recited in claim 55) have been overlooked.
2. The time for response the new Office Action needs to be re-started as of 4/2//2004. Claims 1-18 and 53-62 are pending in the application.
3. The objection to specification, 112-second-paragraph rejections to 15-17 and 59 and double patenting rejection to claims 1-18 and 53-62, as set forth in the Office Action mailed on 4/14/2003, are withdrawn. Claims 1-18 and 53-62 are pending in the application.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1-18 and 54 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The aforementioned claims fail to interrelate essential elements (i.e. capacitor dielectric and electrode) of the invention (i.e. a capacitor). In other words, the omitted essential steps are: forming a capacitor dielectric and electrode layer. Without the aforementioned steps, a capacitor cannot be formed.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-4, 7, 8, 11 are rejected under 35 U.S.C. 102(e) as being anticipated by DeBoer (US 6,326,277).

The applied reference has a *common assignee* with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

In re claims 1-2, DeBoer, in Fig.9 and related text, expressly teaches the claimed method, comprising:

- forming a capacitor storage node layer 134 over a substrate 187, the capacitor storage node layer 134 having an uppermost rim defining an opening 120 (i.e. the cavity) into an interior volume; and
- forming a cap 150 by capping at least a portion of the rim within the interior volume by forming a material (i.e. an insulative material) which is different from the capacitor storage node layer 134 (i.e. HSG) over the rim portion.

- forming a capacitor dielectric region 150 and a cell electrode layer 160 over the capacitor node layer 134 within the interior volume (Fig.9)

In re claim 3, DeBoer also teaches that the capping of the rim portion comprises forming an insulative material 150 within less than an entirety of the interior volume (i.e. less than the interior volume of the opening 120) (Fig.9).

In re claim 4, DeBoer further teaches that the capping of the rim portion comprises forming an insulative material layer 150 over the substrate 187 and anisotropically etching the insulative material layer 150 by patterning (Fig.9).

In re claim 7, DeBoer also teaches that the forming of the capacitor storage node layer 134 comprises forming a container 120 (i.e. the cavity) into a container-defining material 132/199 over the substrate 187; forming a capacitor storage node layer 134 within the container 120; and recessing the capacitor storage node layer 134 to below an uppermost surface of the container-defining material 132/199 (Fig.9).

In re claim 8, DeBoer further teaches that the capacitor storage node layer 134 comprises roughened polysilicon (i.e. HSG)(col.10, lines 14-16).

In re claim 11, DeBoer also teaches that the forming of the capacitor storage node layer 134 comprises forming a container 120 into a container-defining material 132/199 over the substrate 187; forming a capacitor storage node layer 134 within the container 120; recessing the capacitor storage node layer 134 to below an uppermost surface of the container-defining material 132/199; and wherein the capping of the rim portion comprises forming an insulative material layer 150 over the substrate 187 and anisotropically etching the insulative material layer 150 by patterning (Fig.9).

Allowable Subject Matter

8. Claim 53 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 55-62 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither teaches nor suggests *after* the capping of the rim, forming a capacitor dielectric region over the capacitor storage node layer (claims 53 and 55); prior to capping filling *less than* the interior volume with a filler material which is present during the capping (claims 58, 59); and after the capping of the rim portion, *removing* some of the *container-defining material* (claims 61, 62).

Response to Arguments

11. Applicant's arguments filed 8/13/03 have been fully considered but they are not persuasive for the reasons as follow.

In re claim 1, applicant's argument is on the ground that the insulative material layer 150 of DeBoer cannot be interpreted as "a cap" because the insulative material 150 "**drapes** over an entirety of the storage node layer 134", which does not "teach or suggest the **ordinary and customary meaning of a cap.**" (lines 7-15, page 14)

Contrary the argument, DeBoer does teach or suggest forming the cap 150 by capping at least a portion of the rim (i.e. the protruded portions on a top surface of hemispherical grained silicon or the storage node layer 134) within the interior volume (i.e. an opening within 128) by forming a material 150 (i.e. an insulative material) over the rim portion (Fig.9).

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Since the insulative material 150 **covers the top or end of crown** (i.e. the rim or the protruded portions), the insulative material 150 can be interpreted as the “cap.” The Examiner disagrees that the insulative material 150 **drapes** over the storage node layer 134 (last two lines of page 140) because the insulative material 150 does **not rest or hang limply** over the storage node layer 134, wherein the definition of “drape” is from *WEBSTER’S II New Riverside University Dictionary*, page 403, 1984. The insulative material 150 is **chemically formed** over the underlying storage node layer 134, not **physically hang limply** over the storage node layer 134, which can be comprehended to the ordinary skilled in the art.

In re claims 2-13 and 53, in particular claim 4, applicants further argued that DeBoer does not teach or suggest anisotropically etching the insulative material layer 150. (third paragraph, page 15)

Contrary to the argument, DeBoer does teach anisotropically etching by patterning the insulative material 150 to form the container-type shape layer 150. One of the ordinary skill in the art would have recognized that the patterning step is a well-known anisotropically etching step although DeBoer does not literally use the term “etching” in forming layer 150.

In re claims 14-18, 54-57 and 60, the 102(e) rejection over DeBoer teachings has been withdrawn.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on M-F (9:00 ~ 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Olik Chaudhuri can be reached on 571-272-1855.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hsien-Ming Lee
Examiner
Art Unit 2823



April 2, 2004